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Series 31í-B5 CNC for Milling
STANDARD FEATURES

Axis Control	
Digital Servo Function	
1 Controlled Path	
3 (up to maximum of 5) Simultaneously Controllable Axes (J801) (J803)	
Serial Encoder Interface	
Axis Names Selected from X,Y,Z,U,V,W,A,B,C	
Least Input Increment of 0.001mm, 0.0001", 0.001deg	
Inch/Metric Conversion (J876)	
Interlock per Axis	
Machine Lock	
Emergency Stop	
Overtravel Signal	
Stored Stroke Check 1	
Mirror Image	
Follow-up Function	
Servo Off	
Mechanical Handle Feed	
Backlash Compensation	
Stored Pitch Error Compensation (J841)	
Operation	
Memory Operation	
DNC Operation	
MDI Operation	
Program Number Search	
Sequence Number Search	
Buffer Register	
Dry Run Mode	
Single Block Mode	
Manual Feed Mode (Jog)	
Manual Reference Point Return	
Manual Handle Feed (J835)	*(requires MPG)*
Incremental Feed	
Interpolation	
Positioning (G00)	
Exact Stop Mode (G61)	
Exact Stop (G09)	
Linear Interpolation	
Circular Interpolation	
Dwell (G04)	
Helical Interpolation (J819)	
Skip Function (G31)	
Automatic Reference Point Return (G28, G29)	
Reference Point Return Check (G27)	
2nd Reference Point Return (G30)	

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Feed Function

- Rapid Traverse Feedrate 240m/min (100m/min @0.0001mm increment)
- Rapid Traverse Feedrate Override (preset value, 25%, 50%, 100% settings)
- Feed per Minute
- Tangential Speed Control
- Cutting Feedrate Clamp
- Automatic Acceleration/Deceleration (Rapid Traverse: Linear; Cutting Feed: Linear or Exponential)
- Rapid Traverse Bell-Shaped Acceleration/Deceleration
- Feedrate Override 0-254%
- Jog Override 0-655.34 %
- Override Cancel

Programming

- EIA/ISO Automatic Identification
- Label Skip
- Parity Check
- Control In/Out
- Optional Block Skip
- Maximum Programmable Value - 8 digits
- Program Number - O with 4 digits
- Sequence Number - N with 5 digits
- Absolute or Incremental Command
- Programmable Data Input (G10)
- Decimal Point Input
- 10 Times Input Unit
- Plane Selection (G17, G18, G19)
- Rotary Axis Setting
- Rotary Axis Rollover
- Coordinate System Setting (G92)
- Automatic Coordinate System Setting
- Manual Absolute On/Off
- Subprogram Calling
- Canned Drilling Cycles (G73, G74, G76, G80-G89, G98, G99) (J890)
- Specifying the Radius of an Arc

Auxiliary and Spindle Functions

- Miscellaneous Function - M with 8 digits
- Miscellaneous Function Lock
- High Speed M/S/T Interface
- Multiple Commands of Miscellaneous Functions (up to 3)
- Spindle Function - S with 5 digits
- Serial Spindle Interface (J850)
- Spindle Override 0-254%

Tool Functions and Tool Compensation

- Tool Function - T with 8 digits
- 32 Tool Offsets
- Tool Length Compensation (G43, G44, G49)
- Tool Radius/Tool Nose Radius Compensation (J930)

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Series 31i-B5 CNC for Milling

Part Program Storage & Editing

- 256KB Part Program Storage (J945)
- 63 Stored Part Programs
- Part Program Editing
- Part Program Protection
- Multi Part Program Editing (J956)
- Extended Part Program Editing

Display

- Status Display
- Clock Function
- Current Position Display
- Program Display
- Parameter Setting Display
- Self Diagnosis
- Alarm Display
- Alarm History Display
- Help Function
- Run Time/Part Count Display (J971)
- Actual Cutting Speed Display
- Servo Adjustment Screen
- System Configuration Display
- English Language
- Data Protection Key

Data Input/Output and Communications

- I/O Link or I/O Link i Interface
- Punch Panel with 2m Cable — A02B-0236-C192 in LCD Mount, A02B-0120-C192 in Stand Alone.
- Reader/Punch Interface 1 (RS-232) (J900)
- External Workpiece Number Search
- External Data Input (J913)
  - includes External Tool Offset
    - External Message
    - External Machine Origin Shift
    - External Program Number Search
- Status Output Signal

Other

CD-ROM containing Product Manuals		included in the BOM of the Root CNC	
Operation and Maintenance Handbook		B-64487EN	FS30i/31i/32i-Model B Oper and Maint Handbook
	Qty 1	A02B-0120-K324	CONNECTOR AND PINS
Miscellaneous conn:	Qty 2	A02B-0120-K301	HONDA CONNECTOR
	Qty 1	A02B-0120-K323	CONNECTOR AND PINS
Spare Fuses		A02B-0236-K100 LCD	or A02B-0265-K100 Stand Alone
Cable Clamps		A02B-0303-K001	8 CABLE CLAMPS
Grounding Bar		44B295864-001	GROUNDING BAR 11 SLOT

Series 31í-B5 CNC for Milling

SERIES 31í-B5 PACKAGE CHOICES

Package A	Package B	
3 Axes	3 Axes	
2 Slot Rack	2 Slot Stand Alone	
LCD Mount	HSSB	
Embedded Ethernet	Embedded Ethernet	
15" LCD Color Touch		
PMC 24K Steps	PMC 24K Steps	
Serial Spindle	Serial Spindle	
CPU Card B2	CPU Card B2	
Basic Function G421	Basic Function G421	G421 => Supports 2 Paths,12 axes (12 per path), 4 spindles (4 per path)
Sep Vert Type MDI		=> A02B-0323-C128 or equivalent
Axis Card A12	Axis Card A12	
PACKAGE DEPENDENT OPTIONS		
		Automatic Data Back-up, 3 Sets of Back-up Data, SRAM + PPS
PROFIBUS DP Master	PROFIBUS DP Master	
PROFIBUS DP Slave	PROFIBUS DP Slave	
HSSB	Fast Ethernet	
Fast Ethernet	Data Server	
Data Server	Remove HSSB	
2nd Fast Ethernet Brd	10.4" LCD A Color Tch	
	15.0" LCD Col w/ Tch	
	CNC HSSB Card	
	Sep MDI	
	2nd Fast Ethernet Brd	
	3rd Fast Ethernet Brd	
		USB Memory I/O is available on LCD Mount CNCs & the LCD for S.A.

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Series 31í-B5 CNC for Milling

OPTIONS

	Series 31í-B5 CNC Express Package A for Milling - 15" LCD Mount w/ Touch Screen.	
	Series 31í-B5 CNC Express Package B for Milling - 4 Slot Stand Alone.	***Choose Only 1.***
Package A Options		
	PROFIBUS DP Master Board (J311, S731, J562#6552)	**Choose no more than two**
	PROFIBUS DP Slave Board (J313, S732, J563#655C)	**Option Boards**
	PROFIBUS Application Software, J535#655B, required for all PROFIBUS	
	HSSB Board (High Speed Serial Bus) (J202) (includes Extended D/L Function,10m F/O cbl)	
	1st Fast Ethernet Board (J147) (Requires Ethernet or Data Server)	
	Fast Ethernet Function (S707) (Uses FOCAS Protocol)	
	Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)	
	2nd Fast Ethernet Board (J147) (Additional Ethernet Port) Requires (S707).	
Manual Guide í in Package A - Requires Custom Macro (J873) for full functionality.		
	Manual Guide í (S790)	
	Manual Guide í Multi Path Function (S786) for 2 paths. ***Requires (S790).***	
Package B Options		
	PROFIBUS DP Master Board (J311, S731, J562#6552)	**Choose no more than four**
	PROFIBUS DP Slave Board (J313, S732, J563#655C)	**Option Boards**
	PROFIBUS Application Software, J535#655B, required for all PROFIBUS	
	1st Fast Ethernet Board (J147) (Requires Ethernet or Data Server)	
	Fast Ethernet Function (S707) (Uses FOCAS Protocol)	
	Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)	
	2nd Fast Ethernet Board (J147) (Additional Ethernet Port)	*Req's 1st Ethernet Board & (S707)*
	3rd Fast Ethernet Board (J147) (Additional Ethernet Port)	*Requires 2nd Fast Ethernet Board*
	Use HSSB from Package B for the LCD. (Removes A02B-0207-J900) Required to order LCD.	
	10.4" LCD A Color w/ Tch Scrn (C084)(290x220mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324, A02B-0319-K191	**Only one LCD**
	15.0" LCD Color w/ Tch Scrn (C092)(400x320mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324	**Req MDI below.**
	CNC Side HSSB Board (incl's A02B-0207-J900,10m F/O cbl) ***Requires one Option Slot***	
	Without Standard CNC Display Unit - HSSB (J389) connects to Panel i or PC side HSSB.	
	Without Standard CNC Display Unit - Embedded Ethernet (J390) connects to iPendant only	
	Ethernet Display Function (R950 & J573#658N) Embedded Ethernet to PC, not for iPendant	
	Sep Type MDI (Vert PC Type) (QWERTY) (290x160mm)	A02B-0323-C128 or equivalent
	Sep Type MDI (ONG Type) (Vertical) (290x220mm)	A02B-0323-C126#M or equivalent
	Sep Type MDI (ONG Type) (Horizontal) (230x220mm)	A02B-0303-C125#M or equivalent
Manual Guide í in Package B - Requires Custom Macro (J873) for full functionality.		
	Manual Guide í (S790)	
	Manual Guide í Multi Path Function (S786) for 2 paths. ***Requires (S790).***	
	10.4" Color LCD A w/ Touch Screen does not support "Large Window Animation" in Manual Guide í.	
	High Speed Serial Bus (HSSB) includes: *Extended D/L Function J900 & 10m F/O Cable*	

Series 31í-B5 CNC for Milling

SERIES 31í-B5 MILLING OPTIONS

The following options may be ordered for Packages A or B

Basic Function		
	G431 Basic S/W for up to 4 paths, 20 controlled axes,12 per path, and 6 spindles,4 per path	
Number of Paths		
	Two Control Paths	Minimum of 6 Axes
	Three Control Paths, requires G431 Basic Function	Minimum of 9 Axes
	Four Control Paths, requires G431 Basic Function	Minimum of 12 Axes
Axis Control: up to 20 axes and 6 spindles are possible.		
	4th Axis	
	5th Axis	
	6th Axis	
	7th Axis	
	8th Axis	
	9th Axis	
	10th Axis	
	11th Axis	
	12th Axis	
	13th Axis, Requires G431 Basic SW, changes to A13 Servo Card, 1 FSSB Servo Line	
	14th Axis	
	15th Axis	
	16th Axis	
	17th Axis	
	18th Axis	
	19th Axis changes to A24 Servo Card, 2 FSSB Servo Lines	
	20th Axis	
Number of Serial Spindles (default is one). >1 Spindle per path requires Multi Spindle Control.		
	2 Spindles	
	3 Spindles	
	4 Spindles	
	5 Spindles, Requires >= 2 Paths.	
	6 Spindles	
	Multi Spindle Control. **Required if more that one spindle is used per path.**	
Analog Spindle.		
	Analog Spindle (J860) replaces Serial Spindle (J850).	**Having Serial Spindle requires R584.**
Serial/Analog Spindle Control - includes Multi Spindle Control.		
	1 Serial Spindle and 1 Analog Spindle (R584, J850, J860)	
	2 Serial Spindles and 1 Analog Spindle	
	3 Serial Spindles and 1 Analog Spindle	
	4 Serial Spindles and 1 Analog Spindle, Requires >= 2 Paths.	
	5 Serial Spindles and 1 Analog Spindle	

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Axis Control Options		
	Axis Control by PMC (up to 16 axes) (J804)	
	Synchronous Axis Control (up to 6 pairs axes) (J843)	
	Controlled Axis Detach (J807)	
	Chopping Function (J707)	
	Least Input Increment of 0.0001mm, 0.00001", 0.0001deg (J805)	
	Dual Position Feedback (J704)	
	Stroke Limit External Setting (J845)	
	Stored Stroke Check 2 (J840)	
	Stored Limit Check Before Move (J749)	
	Interpolation type pitch error compensation (S644)	
	Bi-directional pitch error compensation (S656)	
	Straightness Compensation (J747) (4 points)	
	Interpolation Type Straightness Compensation (S639) (128 points)	
	Position Switch (J846)	
	Rotary Axis Control (J743)	
5 Axis Features, for paths controlling 5 axes simultaneously.		
	Tool Center Point Control for 5-axis Machining (S677)	
	Tilted Working Plane Indexing Command (R522)	
	Cutter Compensation for 5-axis Machining (S667)	
	Workpiece Setting Error Compensation (S993)	
	3-dimensional manual feed (S679)	
Operation		
	Program Restart (J838)	
	Tool Retract & Recover (J823)	
	Retrace (J730)	
	Manual Handle Retrace (J998)	
	Manual Handle Feed 2/3 Units (J836)	
	Manual Handle Interruption (J837)	
	Change Active Offset Value with Manual Move (S825)	
Interpolation		
	Unidirectional Positioning (G60) (J812)	
	Polar Coordinate Interpolation (J815)	
	Cylindrical Interpolation (J816)	
	Thread Cutting and Feed per Revolution (J824)	*(requires Spindle Encoder)*
	High Speed Skip (J848)	
	Multi Step Skip (J849)	
	3rd, 4th Reference Point Return (J830)	
	Normal Direction Control (J813)	
	Index Table Indexing (J822)	*(requires 4th Axis)*
	Linear Scale I/F w/ absolute address reference mark (J670). Requires Separate Detector I/F.	
Feed Function		
	Bell Shaped Acc/Dec After Interpolation for Cutting Feed (J829)	
	2nd Feedrate Override (J810)	
	Inverse Time Feed (J715)	
	AI Contour Control I (30 Block Look Ahead) (S807)	***Choose only one***
	AI Contour Control II (200 Block Look Ahead) (S808)	
	Machining Condition Selecting Function (S637) Requires AICC I or AICC II.	
Grinding Options		
	Canned Cycles for Grinding (J877)	

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Programming		
	Optional Block Skip (total 9) (J955)	
	Polar Coordinate Command (J818)	
	Workpiece Coordinate System (G52-G59) (J894)	
	Additional Work Coordinate System, 48 Pairs (J895)	
	Workpiece Coordinate System Preset (J917)	
	Optional Angle Chamfering/Corner Rounding (S615)	
	Custom Macro (J873)	
	Additional Custom Macro Common Variables (J887)	
	Interruption for Custom Macro (J874)	
	Pattern Data Input (J884)	
	Peck Drilling Cycle for Small Hole (J896)	
	Scaling (J892)	***Choose only one***
	Automatic Corner Override (J891)	
	Coordinate System Rotation (J893)	
	Programmable Mirror Image (J880)	
	Series 15 Tape Format (J882)	
	Macro Executor (J888) 96K Reserved for System S/W.	***Choose only one Macro***
	Macro Executor + C-language Executor (J734) 700K Reserved for System S/W.	
	FANUC PICTURE Executor (R644) 2M Reserved for System S/W.	Available with J888/J734.
	Custom Software Size 512KB (J738#512K)	*Not with J734 or R644.*
	Custom Software Size 2MB (J738#2M)	*Not with R644.*
	Custom Software Size 4MB (J738#4M)	***Choose only one Custom Software Size.***
	Custom Software Size 6MB (J738#6M)	
	Custom Software Size 8MB (J738#8M)	
	Custom Software Size 12MB (J738#12M)	
PMC Options		
	PMC with 32K Steps (H990#32K)	
	PMC with 64K Steps (H990#64K)	
	PMC with 100K Steps (H990#100K)	***Choose Only One.***
	PMC with 300K Steps (H990#300K)	
	Multi-path PMC function (3 paths) (R855#3)	
	Multi-path PMC function (5 paths) (R855#5)	***Choose Only One.***
	PMC symbol, comment, and message capacity expansion (512KB) (R856#512K)	
	PMC symbol, comment, and message capacity expansion (1MB) (R856#1M)	
	PMC symbol, comment, and message capacity expansion (2MB) (R856#2M)	***Only One.***
	Function Block Function (R852)	
	I/O Link expansion 2nd Channel w/ A20B-1007-0680 and 1m cable.	
	I/O Link expansion 3rd Channel w/ A20B-1008-0360 and 1m cable.	
	Dual Check Safety (S661) Req's I/O Link i, I/O Link 3rd Channel, or PROFIBUS Master.	
	I/O Link í will be used for Dual Chack Safety.	**Check here:**
Auxiliary and Spindle Functions		
	1st Spindle Orientation (J853) (Applies to 1st Spindle per Path)	*(req's Serial Spindle)*
	Constant Surface Speed Control (J855)	*(requires Spindle Encoder)*
	2nd Miscellaneous Function (B8-digit binary) (J920)	
	Rigid Tapping (J828)	*(Analog Spindle req's Spindle Encoder.)*
	Retraction for Rigid Tapping (J664)	
	See Drives Tab for Spindle Separately Mounted Position Encoder.	

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Tool Functions and Tool Compensation		
	64 Tool Offset items (J925)	**Assignable by parameter per path.**
	99 Tool Offset items (J926)	***Choose only one***
	200 Tool Offset items (J927)	
	Tool Offset Memory C (D/H code, Geometry/Wear) (J937)	
	Tool Offset (S617)	
	Tool Life Management (J935)	
	Automatic Tool Length Measurement (S618)	
Part Program Storage & Editing	**Total PPS in the system, available to all paths.**	
	512KB Part Program Storage (J946) (Approx 1280m)	
	1MB Part Program Storage (J947) (Approx 2560m)	***Choose only one***
	2MB Part Program Storage + 1000 Stored Part Programs (J948) (J953) (Approx 5120m)	
	4MB Part Program Storage + 1000 Stored Part Programs (J949) (J953) (Approx 10240m)	
	8MB Part Program Storage + 1000 Stored Part Programs (J959) (J953) (Approx 20480m)	
	Playback (J879)	
	Machine Time Stamp (J964)	
FANUC Picture		
	FANUC Picture Function (S879) Req's LCD w/ Tch Pnl, deletes J682, not w/ J734/J888/R644	
	FANUC Picture Function for non-Touch panel display (S944)	Not w/ J734, J888 or R644
Ethernet or HSSB Options		
	Use Embedded Ethernet for BOP2 or Ladder Edit Function	
	Basic Operation Package (BOP2) Function (J814) & CD	*(Also works w/ embedded Ethernet)*
	CNC Screen Display Function (J858)	
	Application Disk for HSSB	
	Application Disk for Ethernet	
	CNC Screen Dual Display Function (S884)	
	CNC Screen Display for 19" Panel í (R624)	19" Panel í requires one of these options
	Enlarged CNC Screen Display for 19" Panel í (R673)	
	Ladder Edit Function (J820)	*(Also works w/ embedded Ethernet)*
	Ethernet/IP Adapter Function (R967), requires Ethernet (S707)	
	Ethernet/IP Scanner Function (R966), requires Ethernet (S707)	
Display		
	Graphic Display (J972)	***Requires LCD or CNC Screen Display Function***
	Software Operator Panel (J960)	
	Software Operator Panel General Purpose Switch (J961)	
	Selection of Five Optional Language (R521)	
	Touch Panel Control (J682)	**Req'd when iPendant w/ Touch Screen is the only display.**
Data Input/Output and Communications		
	You may overwrite the QTY fields for qty >1	**Qty**
	Compact Flash Card 128MB, Card Adapter B	
	Compact Flash Card 1GB *(suggested for use with Data Server)* , 2 Card Adapters	
	2nd Reader/Punch Interface (RS-232) (J901)	

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Parallel Axis Tracking		
	Parallel Axis Tracking (S895) is the tracking of the W/Z Zero position when W and Z axis are parallel axes. Activated by G-Code. Applicable to popular Horizontal Boring Machines. Requires J888, J738#256K, J894, J917 & at least 4 axes. Includes DVD and Manual.	
***i* AdaptS**	Check to override required DVD.	
	i AdaptS (S898) maintains a constant load during part processing by modifying the feedrate override. This allows for the fastest possible cycle time based on the condition of the tool, part geometry and material variation. By maintaining the manufacturer's recommended load on the tool, tool life can also be extended. ***i*** AdaptS works on the first serial spindle in the first path only. Req's J873,J810,J738#2M,J734.	
	i AdaptS S/W DVD D75F-0102-PB00	
	i AdaptS S/W DVD with FANUC Picture (R644). Req's R644 >=J738#6M. D75F-0103-PB00.	
Cables	Optional: Replace 10m cable for LCD orderable with Package B with one of the following:	
	Fiber Optic Cable, CNC to LCD, 1m	
	Fiber Optic Cable, CNC to LCD, 5m	
	Fiber Optic Cable, CNC to LCD, 20m	
Different MDI's		
	Separate Type MDI (ONG) (Vertical)	*Replaces Vertical QWERTY in Pkg A*
	A02B-0323-C126#M or equivalent	
	Separate Type MDI (ONG) (Horizontal)	*Replaces Vertical QWERTY in Pkg A*
	A02B-0323-C125#M or equivalent	
Product Manuals		
	Series 30i/31i/32i-B Descriptions	
	Series 30i/31i/32i-Model B Connection Manual Hardware	
	Series 30i/31i/32i-Model B Connection Manual (Function)	
	Series 30i/31i/32i-Model B Maintenance Manual *	
	Series 30i/31i/32i-Model B Parameter Manual *	
	Series 30i/31i/32i-B User's Manual Common & Maching Center*	
	Series 30i/31i/32i FAST Ethernet/Data Server Operator's Manual	
	Manual Guide i Operator's Manuals & Setup Guide	
	Series 30i/31i/32i Model B Operation and Maintenance Handbook	